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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/598,142	08/18/2006	Masaru Shirai	P30470	1550

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EXAMINER	
D'ANIELLO, NICHOLAS P	
ART UNIT	PAPER NUMBER
1793	

NOTIFICATION DATE	DELIVERY MODE
06/03/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

gbpatent@gbpatent.com
pto@gbpatent.com

Office Action Summary	Application No.	Applicant(s)	
	10/598,142	SHIRAI ET AL.	
	Examiner	Art Unit	
	Nicholas P. D'Aniello	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 May 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21 and 23-35* is/are pending in the application.

4a) Of the above claim(s) *1-20 and 28-35* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21 and 23-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

The 112 rejections have been withdrawn, however, the art rejections have been maintained, see the response to arguments for clarification. No new references are used and no PTO-892 is attached.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Please note the following relevant sections of the MPEP:

a. MPEP 2115: "Expressions relating the apparatus to contents thereof during an intended operation **are of no significance in determining patentability of the apparatus claim.**" *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969). Furthermore, "[i]nclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims." *In re Young*, 75 F.2d *>996<, 25 USPQ 69 (CCPA 1935) (as restated in *In re Otto*, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963)).

b. MPEP 2114 relating to Apparatus and Article claims – Functional Language: While features of an apparatus may be recited either structurally or functionally, **claims directed to an apparatus must be distinguished from the**

prior art in terms of structure rather than function. >*In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997).

2. Claims 21 and 23-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Okuno et al. (USP 5,338,008).

In regard to **independent claim 21,** Okuno et al. teach a solder bump forming apparatus, see figure 1 (*for forming a solder bump through heating and reflowing a solder composition on a substrate where a plurality of pad electrodes are provided*, is intended use MPEP 2111.02 and does not limit the structure of the apparatus however Okuno et al. forms solder bumps on a printed board PB with pad electrodes by reflowing), wherein: (*the solder composition is made of a mixture of solder particles and a liquid material that contains a flux component, which becomes liquid at a normal temperature or when heated*, relates to the material worked upon by the apparatus MPEP 2115 and does not limit the structure of the apparatus, however Okuno et al. uses a solder paste i.e. solder particles and flux see column 1 lines 26-45); and a heating device (upper or lower heater 3) is provided for heating the solder composite from a first side; and a thermostat device (many elements, such as heating element 7, cooling device 10, rectifying plate 11, fan 16, jacket 17) for controlling a temperature of the solder composition is provided at a position above a mount plate (conveyor 2) (column 3 line 66 - column 4 line 50).

Okuno et al. embrace "wherein the thermostat device includes a system in which the cool air or hot air of the thermostat device does not directly come in contact with the solder composition on the substrate" because (A) Okuno et al. teaches a system (upper

portion of figure 2 above jacket 17) which circulates outside air with fan 20 and constitutes a heat exchange means (and therefore the air is taken to be either hot or cool) for the thermostat device (cooling device 10) but does not allow the outside air to come into contact with the solder composition because jacket 17 completely separates the outside air from the solder composition (see figure 2 - column 4 lines 55-64) and (B) the limitation relates to a functional limitation and as the apparatus of Okuno et al. has all the claimed structure it is reasonably taken to be capable of performing the claimed function.

In regard to **the amendment**, Okuno et al. teaches the apparatus includes a space through which the substrate is conveyed (along and directly above conveyor 2 - see figures 1 and 2) and that the outside air from fan 20 does not come into contact with the substrate and solder on the substrate within that space (column 4 lines 55-64).

In regard to **claim 23**, the thermostat device comprises a radiation plate (jacket 17, gas blowing port 12 in plate) for heating the solder composition by radiant heat and a heating section (preheating section S or heating section H) for heating the radiation plate (figure 2).

In regard to **claim 24** the thermostat device comprises a heat absorbing plate (rectifying plate 11) for depriving heat of the solder composition and an endothermic section (cooling section C) for cooling the heat absorbing plate (figures).

In regard to **claim 25**, the heating device 3 applies heat by blowing hot air (with fan 16) to a bottom side of the substrate (figures).

In regard to **claim 26**, the heating device 3 heats a bottom side of the substrate by thermal conduction (forced air is thermal conduction).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim **27** is rejected under 35 U.S.C. 103(a) as being unpatentable over Okuno as applied to claim 21 above, and further in view of Campbell (USP 4,334,646).

Okuno teaches the solder bump forming apparatus as applied above where the heating device 3 heats the solder composition from the first side of the substrate. **Claim 27** differs from the reference in calling for the substrate to be immersed in the solder composition within a container which is heated. However, Campbell et al. teach a similar solder bump forming apparatus (figure 1) and the desirability to heat the substrate 44, 50 as it is immersed in the solder composition within a container 30; and the heating device heats the solder composition from the substrate side through the container to prevent oxidation from occurring and increase the continuity of the connections (column 3 lines 46-60).

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the substrate in a container immersed in the solder composition in

the apparatus of Okuno as such prevents oxidation creating better connections as taught by Campbell.

Response to Arguments

Applicant's arguments regarding the 112 rejection are persuasive (the claims have been amended to overcome the rejections) and the 112 rejections have been withdrawn.

Applicant's arguments in regard to the art rejections have been fully considered but they are not persuasive. Specifically, the apparatus of Okuno et al. has a space through which the substrate is conveyed (on conveyor 2) and the thermostat device (fan 20) passively controls the temperature without allowing the outside air to come into contact with the solder composition on the substrate within the space as noted above.

Applicant argues that air comes into direct contact with the solder and substrate in Okuno et al., however the air that comes into contact with the solder and substrate in the apparatus of Okuno et al. is not "a cool or hot air of the thermostat device" which is the outside air and is kept separate from the solder and substrate (see figure 2 - column 4 lines 55-64). Applicant also argues that the space in which fan 20 is enclosed does not convey the substrate however this is in not required by the claim. The claim requires that the air from the thermostat device does not come into contact with the solder composition on the substrate within the space (i.e. the substrate is within the space).

Applicant is reminded that the majority of the limitations, although fully embraced by the reference, relates to functional characteristics of the apparatus and do not define the structure (see MPEP 2114 above).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Inquiries

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicholas P. D'Aniello whose telephone number is (571)270-3635. The examiner can normally be reached on Monday through Thursday from 8am to 5pm (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on (571) 272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/N. P. D./
Examiner, Art Unit 1793

/Jessica L. Ward/
Supervisory Patent Examiner, Art Unit 1793